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(72) Inventor: **Halley, James Edwin**
92050 Paris La Défense (FR)

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(74) Representative: **Ruellan-Lemonnier, Brigitte**
THOMSON multimedia,
46 quai A. Le Gallo
92648 Boulogne Cédex (FR)

(71) Applicant: **THOMSON CONSUMER**
ELECTRONICS, INC.
Indianapolis, IN 46206 (US)

(54) **Automatic title or description captioning for a VCR recording**

(57) In a television system in which at least program title information for programs which are to be transmitted in the future is transmitted in advance to form a channel guide listing, apparatus is provided for acquiring one of the title information and the current date, and generating display signal comprising data representing a text screen containing one of the title information and the

current date for recording a user-viewable screen display on a video tape ahead of the television program signal. The title or date information acting as a leader to the following television program. In a second embodiment of the invention, in those instances where descriptive text accompanies the program listing, apparatus of the invention records the descriptive text relating to the title, the star, the director, or the context of the program.

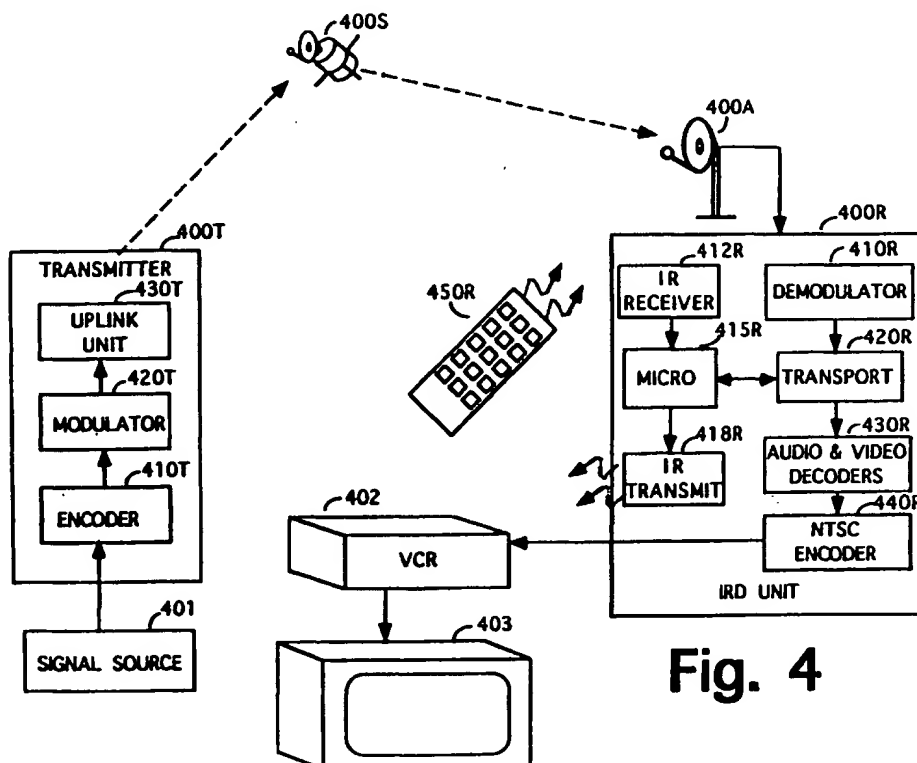


Fig. 4

Description

The subject invention concerns the field of VCRs and television program schedulers.

Many viewers record television programs for playback at a more convenient time. This practice is commonly-known as "time-shifting". Unfortunately, many people nowadays have little free time in their hectic schedules to spend watching these tapes. Consequently, a sizable stack of tapes containing such time-shifted recordings can accrue before the viewer plays them. In the best of all possible worlds, the viewer would have labelled the outside of each tape with the title and date of the recorded television program. In actual practice, however, there is little chance that one is so organized. Consequently, a viewer may have accumulated three or four tapes, each containing an episode of a favorite show and, in the absence of neatly labeled tapes, the viewer must then play a portion of each tape to see if it is the desired episode.

Many camcorders include electronic titling circuitry including a keyboard for adding a text screen overlay to the image being recorded, so that the user can record a title along with the video. However, given the fact that many viewers do not even label their tapes, it is highly unlikely that a viewer would use such a time-consuming and tedious feature to title each tape electronically. Moreover, electronic titling by use of a keyboard is contrary to the current trend in the industry of making the recording of a television program a quick and easy procedure

In a television system in which at least program title information for programs which are to be transmitted in the future is transmitted in advance to form a channel guide listing, apparatus is provided for acquiring at least one of the title information and the current date, and generating display signal comprising data representing a text screen containing at least one of the title information and the current date for recording a user-viewable screen display on a video tape ahead of the television program signal. The user-viewable title or date information then acts as a leader to the following television program. In a second embodiment of the invention, in those instances where descriptive text accompanies the program listing, apparatus of the invention records the descriptive text relating to the title, the star, the director, or the context of the program.

FIGURE 1 is an illustration of a screen display of a portion of a typical channel guide, as known from the prior art.

FIGURE 2 is an illustration of a screen display showing an auxiliary text description associated with a particular program guide entry as known from the prior art.

FIGURE 3 is an illustration of a titling screen display in accordance with the subject invention.

FIGURE 4 is an illustration in block diagram form of apparatus suitable for practicing the invention.

FIGURE 5 is a flow chart illustrating an automatic titling process suitable for use in the subject invention.

Television systems such as the RCA® DSS® direct broadcast satellite system and Starsight® transmit channel guides for display on the television receivers of subscribers.

FIGURE 1 shows a Program Guide screen display produced, for example, by an RCA® DSS® direct broadcast satellite receiver system, manufactured by Thomson Consumer Electronics, Inc. Indianapolis, IN. A user selects a television program from a Program Guide 100 for viewing, by moving a cursor (via operation of remote control up, down, right, and left, direction control keys, not shown) to a block of the program guide screen display which contains the name of the desired program. When a RECORD key of the remote control is pressed, the current x and y position of the cursor is evaluated to derive virtual channel and program time information. In this example, a particular television show, STAR TREK: VOYAGER has been highlighted for selection by use of the cursor keys on a remote control unit (e. g., 450R of FIGURE 4). The highlighting is illustrated by the dark box outlining the title in FIGURE 1. Upon pressing the RECORD key, the relevant programming data is transferred to a programming unit such as VCR 402 of FIGURE 4. This procedure is commonly known as one-touch recording.

In FIGURE 2, a text box 210 is displayed on top of Program Guide 200. Text box 210 contains a title, time, channel, and date information and may also contain a description of the highlighted program. This information is derived from auxiliary information signals transmitted with the program signals. In terrestrial systems, such as Starsight®, it is transmitted during the vertical blanking interval. In the DSS® satellite system, it is transmitted in data packets along with the program guide information, description information packets, and program data.

The subject invention recognizes that this auxiliary information can be used to form a "tape leader" for the program to be recorded. In this way, the program title and date are recorded onto the tape as a user-readable OSD display ahead of the desired television program. FIGURE 3 shows such a screen display 310 being displayed on the screen of a television receiver 300 during playback, just before the start of the recorded program. The display comprises program information such as, title, date, start time, channel, rating, and may also include a description of the program. While it is not necessary to record all of this information, it is preferable that at least title information or at least date information be used to form the program information screen. For example, it may be easy to identify an episode from a given television series (e.g. Star Trek), and all that is necessary for further identification is to display the date on which the episode was recorded. On the other hand, it is also herein recognized that in some instances additional content-descriptive text may be helpful to the viewer in identifying the television program recorded on

the videotape.

As noted above, the channel guide data used by the controller of the subject apparatus may be received from a satellite television communication system, or from standard terrestrial broadcasts. FIGURE 4 shows such a satellite television communication system in which, a satellite 400S receives a signal representing audio, video, or data information from an earth-based transmitter 400T. The satellite amplifies and rebroadcasts this signal to a plurality of receivers 400R, located at the residences of consumers, via transponders operating at specified frequencies and having given bandwidths. Such a system includes an uplink transmitting portion (earth to satellite), an earth-orbiting satellite receiving and transmitting unit, and a downlink portion (satellite to earth) including a receiver located at the user's residence.

In a such a satellite system, the information necessary to select a given television program is not fixedly-programmed into each receiver but is rather is downloaded from the satellite continually on each transponder. The television program selection information comprises a set of data known as a Master Program Guide (MPG), which relates television program titles, their start and end times, a virtual channel number to be displayed to the user, and information allocating virtual channels to transponder frequencies and to a position in the time-multiplexed data stream transmitted by a particular transponder. In such a system, it is not possible to tune any channel until the first master program guide is received from the satellite, because until receiving the guide, the receiver (IRD, or Integrated Receiver Decoder) literally does not know the location of any channel, in terms of frequency and position (i.e. data time slot) within the data stream of any transponder.

A master program guide is preferably transmitted on all transponders with the television program video and audio data, and is repeated periodically, for example, every 2 seconds. The master program guide, once received, is maintained in a memory unit in the receiver, and updated periodically, for example every 30 minutes. Retention of the master program guide allows instantaneous television program selection because the necessary selection data are always available. If the master program guide were to be discarded after using it to select a television program, then a delay of at least two seconds would be incurred while a new program guide was acquired, before any further television program selections could be performed.

Once the channel transponder carrying a desired television program is tuned, the data packets containing the audio and video information for that program can be selected from the data stream received from the transponder by examining the data packets for the proper SCID (Service Component Identifier) 12 bit code. If the SCID of the currently received data packet matches the SCID of the desired television program as listed in the program guide, then the data packet is routed to the

proper data processing sections of the receiver. If the SCID of a particular packet does not match the SCID of the desired television program as listed in the program guide, then that data packet is discarded.

A brief description of system hardware, suitable for implementing the above-described invention, now follows. In FIGURE 4, a transmitter 400T processes a data signal from a source 401 (e.g., a television signal source) and transmits it to a satellite 400S which receives and rebroadcasts the signal to a receiving antenna 400A which applies the signal to a receiver 400R. Transmitter 400T includes an encoder 410T, a modulator (i.e., modulator/forward error corrector (FEC)) 420T, and an uplink unit 430T. Encoder 410T compresses and encodes signals from source 401 according to a predetermined standard such as MPEG. MPEG is an international standard developed by the Moving Picture Expert Group of the International Standards Organization for coded representation of moving pictures and associated audio stored on digital storage medium. An encoded signal from unit 410T is supplied to modulator/Forward Error Corrector (FEC) 420T, which encodes the signal with error correction data, and Quaternary Phase Shift Key (QPSK) modulates the encoded signal onto a carrier.

Uplink unit 430T transmits the compressed and encoded signal to satellite 400S, which broadcasts the signal to a selected geographic reception area. The signal from satellite 400S is received by an antenna dish 400A coupled to an input of a so-called set-top receiver 400R (i.e., an interface device situated atop a television receiver). Receiver 400R includes a demodulator (demodulator/Forward Error Correction (FEC) decoder) 410R to demodulate the signal and to decode the error correction data, an IR receiver 412 for receiving IR remote control commands, a microprocessor 415R, which operates interactively with demodulator/FEC unit 410R, and a transport unit 420R to transport the signal to an appropriate decoder 430R within unit 400R depending on the content of the signal, i.e., audio or video information. An NTSC Encoder 440R encodes the decoded signal to a format suitable for use by signal processing circuits in a standard NTSC consumer VCR 402 and standard NTSC consumer television receiver 403. Microprocessor (or microcontroller, or microcomputer) 415R receives infrared (IR) control signals from remote control unit 450R, and sends control information to VCR 402 via an IR link 418R. Microprocessor 415R also generates the on-screen display (OSD) signals needed for presenting the interactive sentence, or confirmation sentence, to the user. Microprocessor 415R also receives and interprets cursor key X and Y information in order to control the highlighting of user choices in the on-screen displays.

FIGURE 5 is a flowchart showing the operation of the controller (for example microcontroller 415R of DSS receiver 400R) a few moments before the designated recording time of a desired television program. The routine is entered at step 500. At step 515 a command is

sent to VCR 402 (by IR signal or over a control bus) to turn-on the VCR. At step 520, the DSS circuitry is controlled to select the proper television program (i.e., select the proper signal from the correct satellite, from the correct transponder, and from the correct time slot in the data stream). At step 525, a title and description screen display is prepared and output to VCR 402 and television receiver 403. The title and description screen will be displayed on the screen of television receiver 403 if television receiver 403 happens to be turned-on. At step 528 the DSS unit is turned-on (i.e., powered-up from a standby state, if necessary). At step 530, VCR 402 is controlled to start recording. What will be recorded at this time is the title and description screen generated by DSS receiver 400R. At steps 535 and 540, a delay is executed for an appropriate time period to allow the user to read the title and description screen when the tape is played back. At step 545, the title and description screen is removed to allow for the recording of the desired television program. The recording will continue through steps 550 and 555 until the program is over. At step 560 the VCR is controlled to stop recording and turn off. At step 570, DSS receiver 400R is turned off, and the routine is exited at step 575.

Thus, there has been described an apparatus for automatically titling a recording on a video tape, which requires no action on the part of the viewer, other than selecting the program to be recorded. It is important to note that the recorded title information is user-readable when the tape is played back. While the system has been described with respect to one touch recording, it is equally applicable to timer recording, because the DSS® system or Starsight® system can access the necessary data from a knowledge of time and channel. While the invention has been described with respect to a VCR, any recording device, such as recordable videodisc or storage in electronic memory or on a computer-type disc drive, is envisioned and deemed to lie within the scope of the following claims.

Claims

1. Automatic titling apparatus for a recording device, comprising:

means for selecting a particular television program to be recorded at a future time from a plurality of television programs;
 means for acquiring television program schedule information including at least one of a title and a date for each of said television programs;
 means for processing and recording television signals representative of said selected television signal;
 means for generating signals for displaying a message suitable for on-screen display, said message including at least one of said title and

said date information of said particular television program; and
 means for recording at least one of said title and said date information of said particular television program on a storage medium of said recording device as a user-viewable on-screen display message and thereafter recording said particular television program.

2. The automatic titling apparatus of claim 1, wherein: said on-screen display means displays said schedule information to enable selection of said particular television program by said viewer.

3. The automatic titling apparatus of claim 1, wherein: said message recorded on said recording medium includes content-descriptive text relating to said particular television program.

4. Automatic titling apparatus for a recording device, comprising:

a source of television signals and television program schedule information including at least one of a title and a date for each television program in said schedule;
 means for selecting one of said television signals;
 means for processing and recording said selected television signal;
 input means for entering data in response to operation a user;
 means for generating signals for displaying said schedule information in a user-readable form; and
 control means coupled to said input means, said selecting means, and said processing and recording means, for selecting a particular television program for recording from said schedule information in response to said data, said control means accessing said schedule information and causing the recording of at least one of said title and said date information of said particular television program on a storage medium of said recording device as a user-viewable on-screen display message and thereafter recording said particular television program.

5. The automatic titling apparatus of claim 4, wherein: said on-screen display means (403) displays said schedule information to enable selection of said particular television program by said viewer.

6. The automatic titling apparatus of claim 5, wherein: said message recorded on said recording medium includes content-descriptive text relating to said particular television program.

7. A method for automatically titling a recording of a television program when recording said television program on a recording device, comprising the steps of:

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selecting a particular television program to be recorded at a future time from a plurality of television programs;

acquiring television program schedule information including at least one of a title and a date for each of said television programs;

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generating signals for displaying a message suitable for on-screen display, said message including at least one of said title and said date information of said particular television program; and

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recording at least one of said title and said date information of said particular television program on a storage medium of said recording device as a user-viewable on-screen display message and thereafter recording said particular television program.

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8. The method of claim 7, comprising the further step of:

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causing said on-screen display means to display said schedule information to enable selection of said particular television program by said viewer.

9. The method of claim 1, comprising the further step of

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recording on said recording medium content-descriptive text relating to said particular television program.

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CH 150		Program Guide			
		7:00pm	7:30pm	8:00pm	7:05pm 8:30pm
HBO 102		OTHER PEOPLE'S MONEY		FREE PREVIEW	DREAM ON
CBS 106		EVENING NEWS	HOME IMPROVEMENT	BROOKLYN BRIDGE	RAVEN
UPN 123		STAR TREK: VOYAGER		ENTERTAINMENT TONIGHT	WORLD NEWS
CINE 210		EYEWITNESS	FUN CITY		DOUBLE TROUBLE
CNN 305		PRIME NEWS	BOTH SIDES	RELIABLE SOURCES	HOME AND GARDEN
USA 422		COUNTER STRIKE		QUANTUM LEAP	
MORE		MOVIES	SPORTS	OTHER	ALL EXIT

Fig. 1

210

200

CH150		Program		7:00pm		210		200	
HBO 102	OTHER PEOPLE'S MONEY		FR TUE		STAR TREK: VOYAGER		ENTERTAINMENT TONIGHT		RAVEN
CBS 106	EVENING NEWS		FUN CITY		EYEWITNESS		WORLD NEWS		
UPN 123	STAR TREK: VOYAGER		BOTH SIDES		PRIME NEWS		RELIABLE SOURCES		DOUBLE TROUBLE
CINE 210	EYEWITNESS		QUANTUM LEAP		COUNTER STRIKE		QUANTUM LEAP		
CNN 305	PRIME NEWS		OTHER		SPORTS		ALL		EXIT
USA 422	COUNTER STRIKE		MOVIES		MORE				
<div><p>TITLE: STAR TREK: VOYAGER</p><p>STARRING: KATE MULGREW</p><p>START TIME: MON. 7:00 PM</p><p>CHANNEL: 123</p><p>RATING: G</p><p>PROGRAM DESCRIPTION: THE CREW ENCOUNTERS A NEW AND HOSTILE LIFEFORM IN INTERSTELLAR SPACE.</p></div>									

Fig. 2

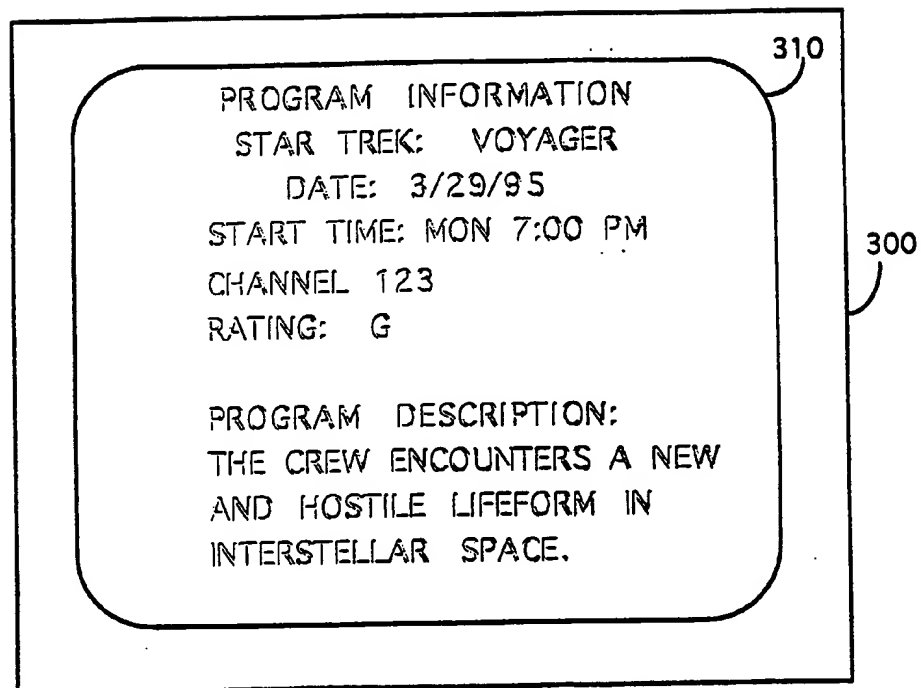


Fig. 3

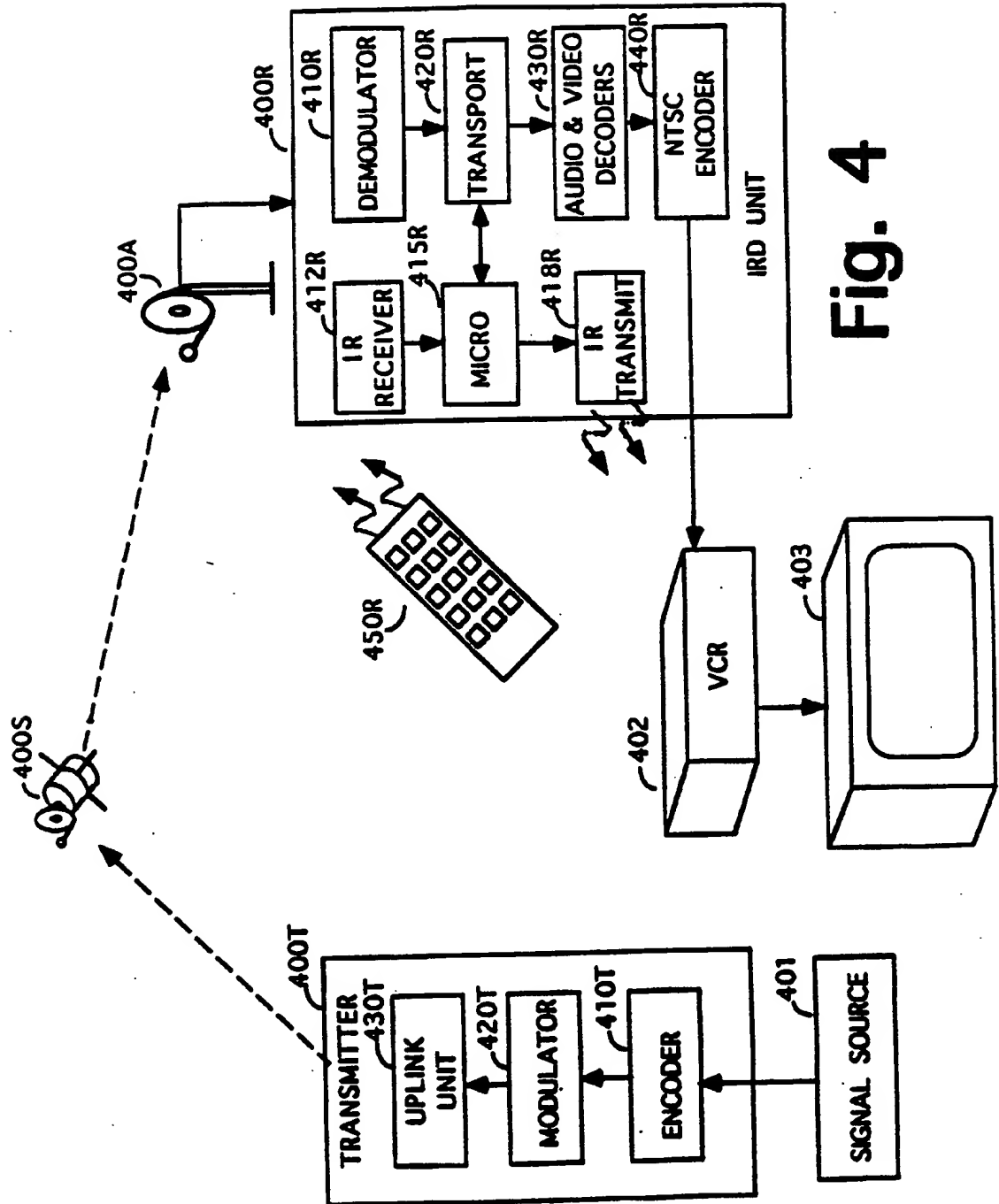


Fig. 4

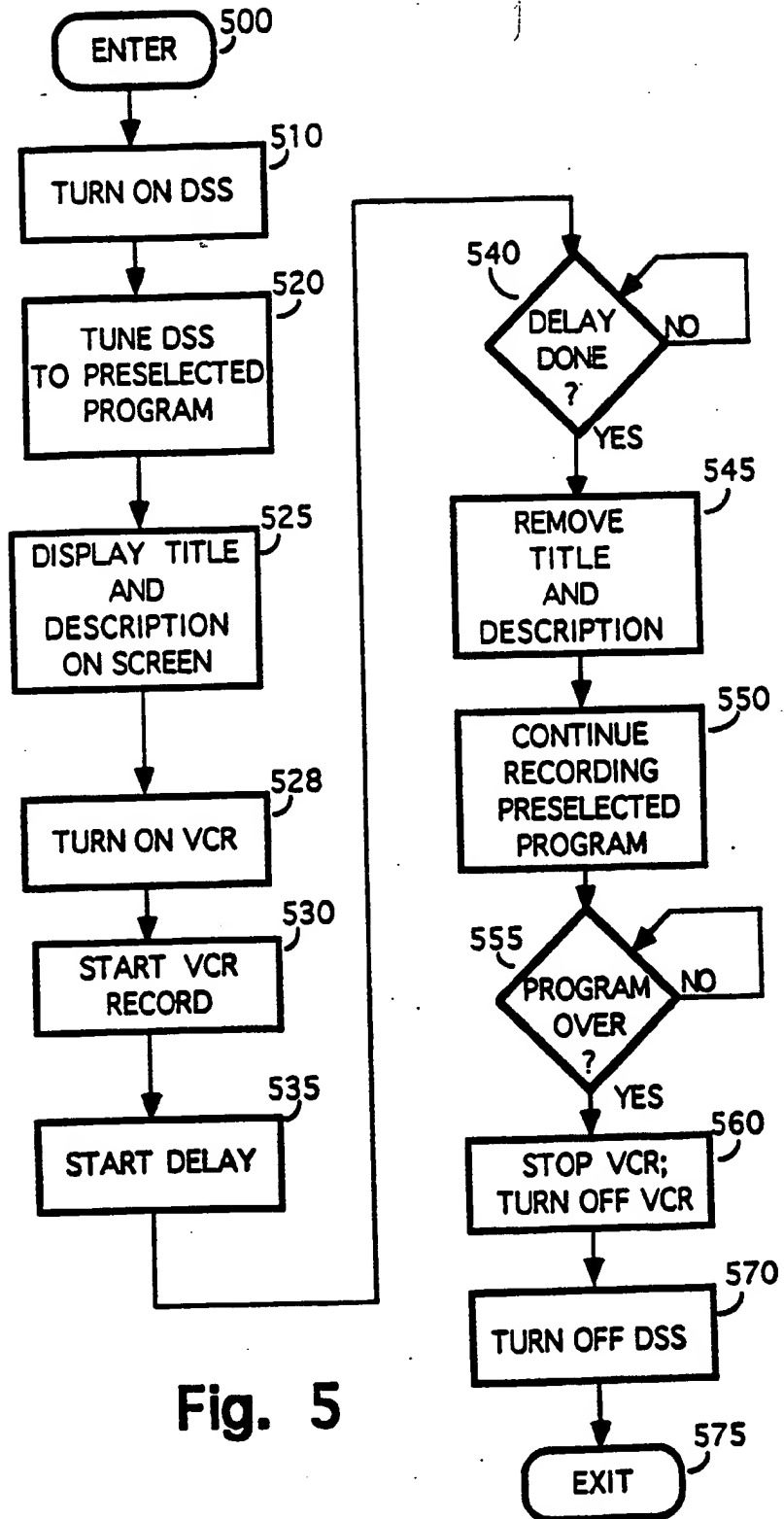


Fig. 5

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